Ontario

Ministry of
Transportation and
Communications

MI-93

THE EFFECTIVENESS OF WATER DRIPS ON DECK SOFFITS

MATERIALS INFORMATION

ENGINEERING MATERIALS OFFICE

THE EFFECTIVENESS OF WATER DRIPS ON DECK SOFFITS

Mike Owens

Ministry of Transportation and Communications

Engineering Materials Office

Concrete Section

April 1986

TABLE OF CONTENTS

	Page
1) Introduction	1
2) Test Procedure	1
3) Observations	2
4) Recommendations	2

List of Figures

Figure 1	3
Figure 2	3
Figure 3	3
Figure 4	4
Figure 5	4
Figure 6	5
Figure 7	5
Figure 8	6
Figure 9	6
Figure 10	7
Figure 11	7

Introduction

Water drips are located on the underside of facias on bridge decks and wingwalls. Their primary function is to allow any moisture that comes from the outside face of barrier walls, curbs and sidewalks to drop from the soffit before it can run or be blown onto the beams and deck underside of a structure.

It has been observed that the slope and location of the drip details used in Ontario has not been effective (See Figure 1). Deicing salts in solution blowing or running across the drip have been responsible for corrosion related deterioration to both steel and concrete beams as well as deck soffits.

This report contains details and illustrations of the testing of new drip configurations proposed by the Committee on the Technology for Structure Durability.

Test Procedure

Two new drip designs were proposed by the Committee (Figure 2 & 3). Forms were constructed to resemble the facia and soffit of a structure and mouldings cut to the new configuration were attached 150 mm from the edge of the facia. Concrete was then cast into the forms and allowed to cure.

After demoulding, the concrete blocks were supported on a flat bed with the drip positioned to simulate that of a bridge deck. The drips were to be tested of angles of 45° (considered to be the maximum) and 30° (Figure 4 & 5). Water was then poured from a bucket or a hose against the vertical face of the facia on both blocks and at each angle. In a separate test, an electric fan (Figure 10) was positioned in front of the drip and allowed to blow on the block as the water was poured.

Observations

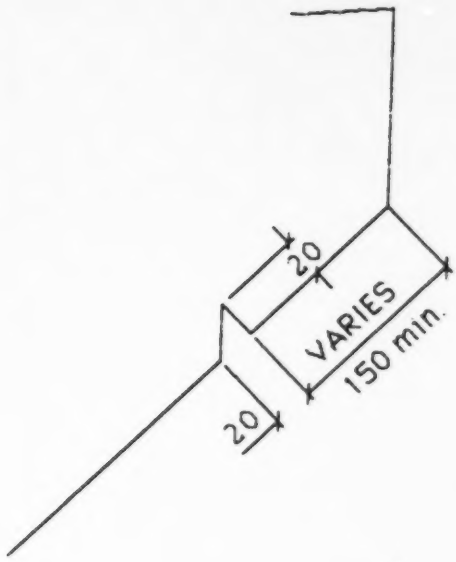
Both of the proposed drip configurations appeared to work well at the 30° angle with both the gravity water feed and the feed blown with the fan (Figure 8 & 9). With the blocks set at 45° the trapezoidal drip proved to be much more effective in arresting the flow of water down the soffit with both the gravity feed and the fan blown water feed. (Figure 6 & 10). With the semicircular shape, the water tended to arc across the gap, especially when the fan was used. (Figure 8 & 11). The additional 20 mm of width of the trapezoidal drip shape appears to contribute to the break in the water flow.

Recommendations

It is proposed that the 60 mm wide trapezoidal drip configuration (Figure 2) be used for feature construction projects.

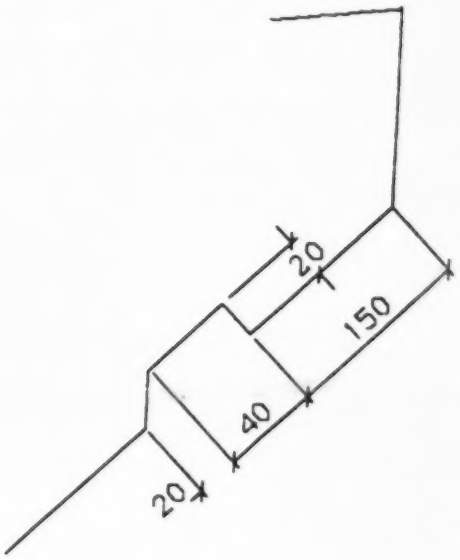
EXISTING DRIP DETAIL

FIG 1



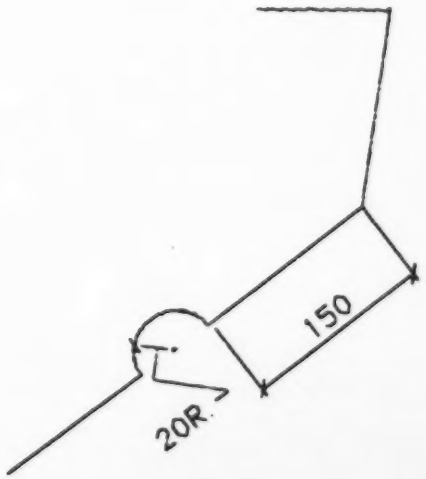
PROPOSED DRIP DETAIL (a)

FIG 2



PROPOSED DRIP DETAIL (b)

FIG 3



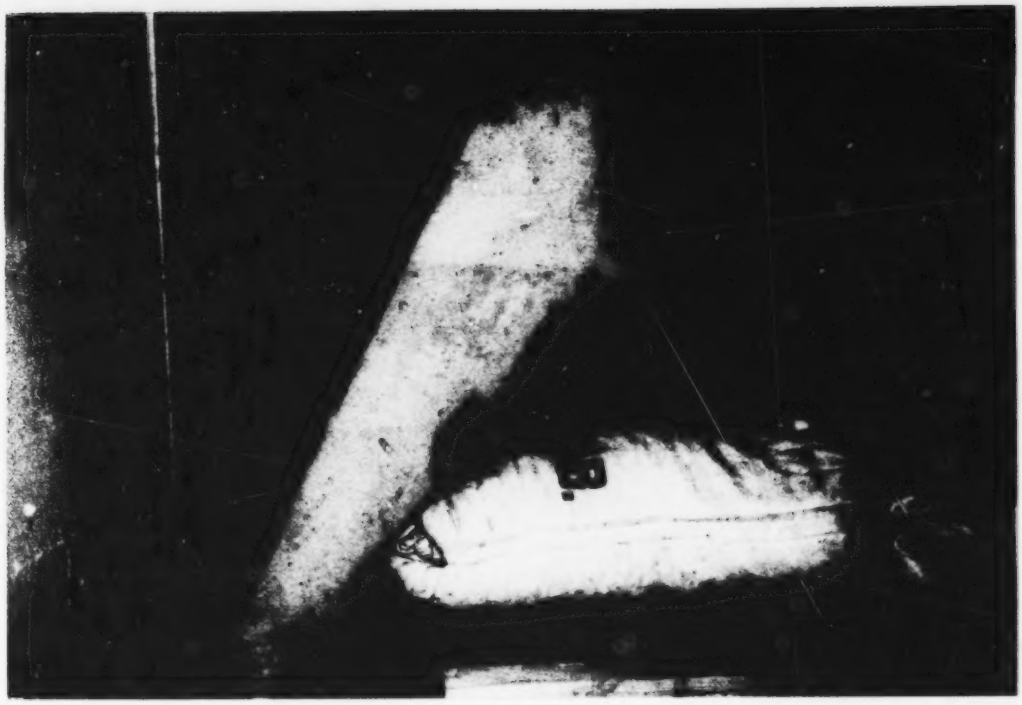


FIGURE 4 60 mm wide trapezoidal drip set at 45°

FIGURE 5 40 mm semicircular drip set at 45°

FIGURE 6 Gravity water feed, trapezoidal drip - block set at 45°

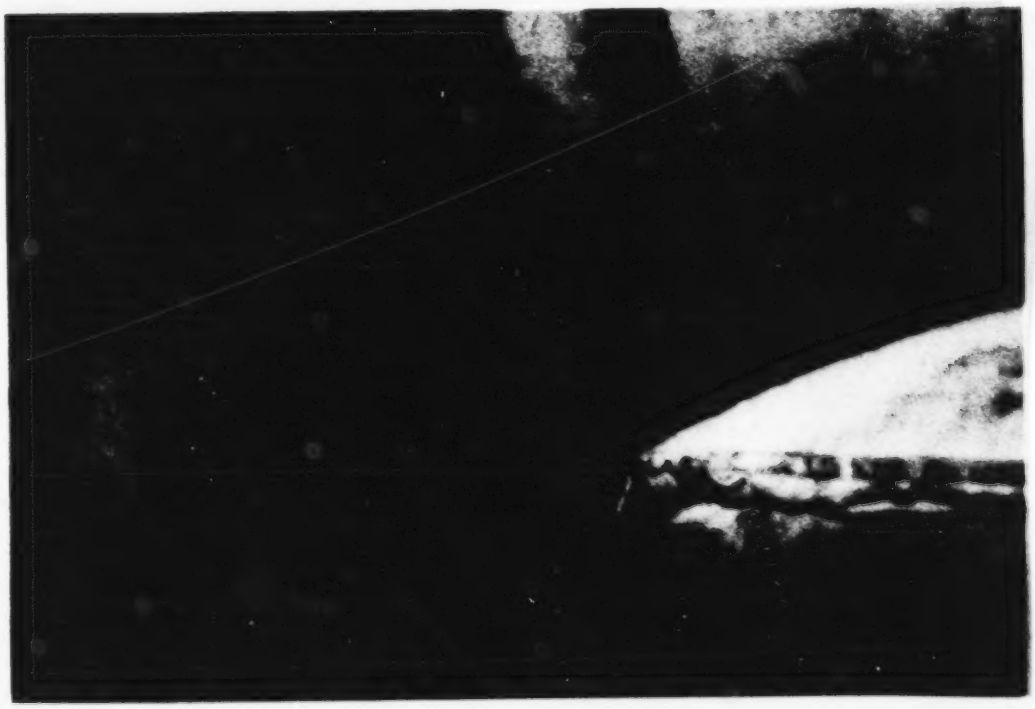


FIGURE 7 Gravity water feed, trapezoidal drip - block set 30°
(area beyond drip wetted prior to test)

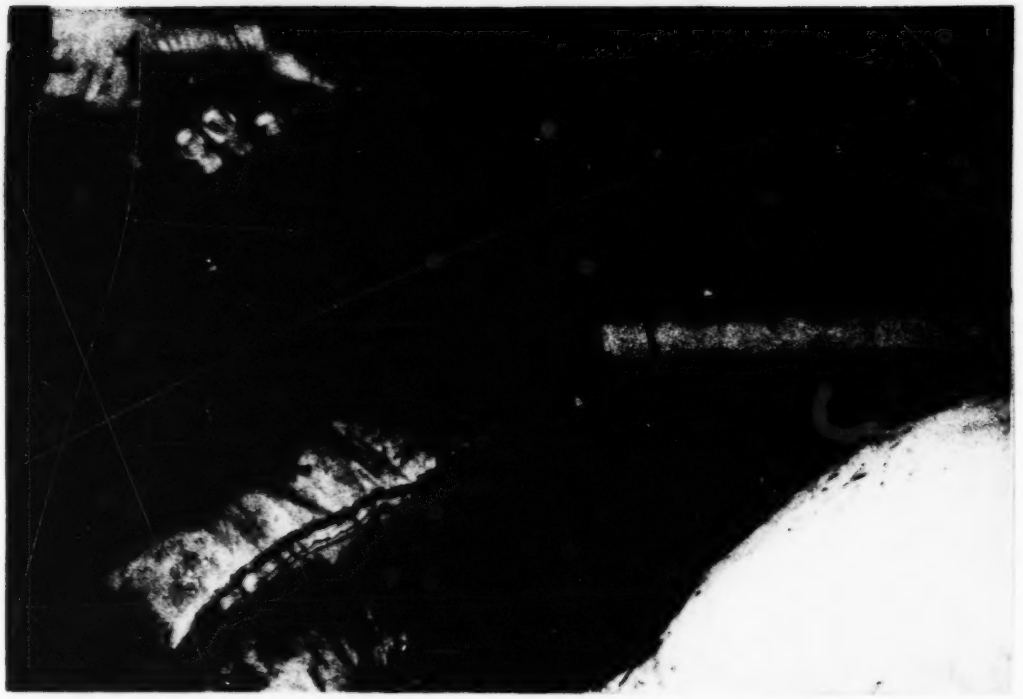


FIGURE 8 Gravity water feed, semicircular drip - block set at 45° (note water arcing across drip)

FIGURE 9 Fan blown feed, semicircular drip at 30°

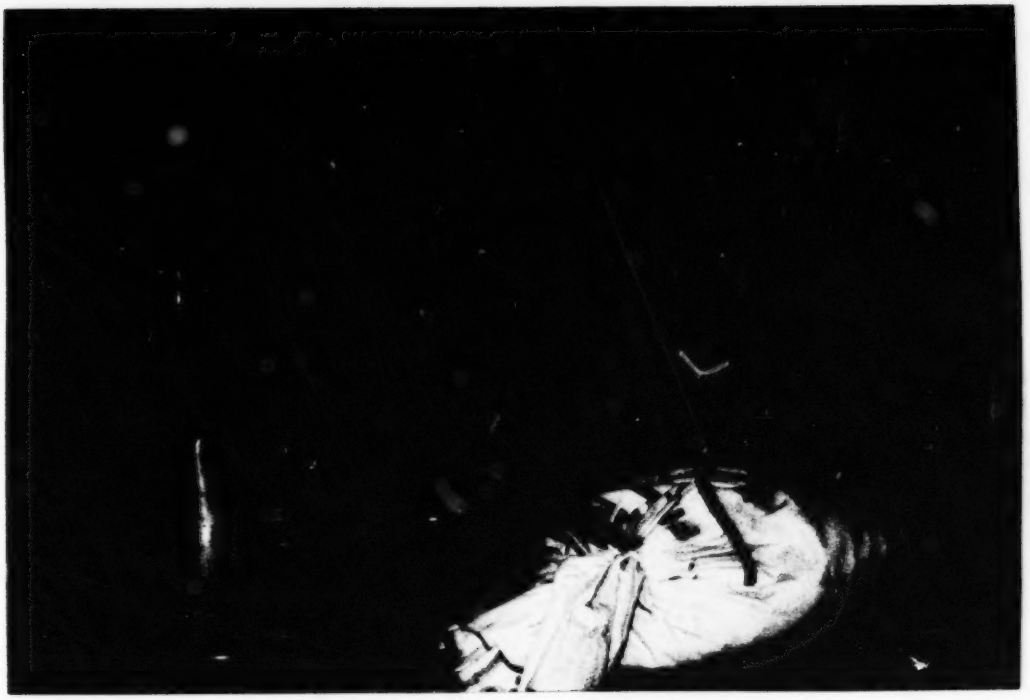


Figure 10

Fan blown feed trapezoidal drip at 45° (note water on far side of drip caused by splashing from flat bed)

Figure 11

Fan blown water feed semicircular drip at 45° (note moisture crossing drip gap)